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ABSTRACT

This self-instructional module includes learner objectives, text, practice exercises and answer sheets addressing developments in research on learning environments and why instructional technologists should take the lead in applying the resulting knowledge to the design of training areas. Favorable learning environments are described in general terms, and specific characteristics of well-designed training facilities are described in detail. Elements covered include classroom size and shape, window and wall structure, and furniture design. The use of color and its psychological effects are also examined. A 15-item test is included. (Author/LMM)

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LEARNING ENVIRONMENTS: An Instructional Module Prepared by Ann L. Wiley at the Rochester Institute of Technology for ICIT 745, Instructional Facilities Design and ICAV 560, Media Facilities Design.

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Objectives:

After completing the module the learner will be able to:

1. Give a reason why instructional technologists might be expected to be concerned with learning environments.

2. Describe a favorable learning experience in terms of the factors which must be conducive to learning and the feelings of the learners.

3. Identify five areas in a training facility with which the instructional designer must be concerned in creating a favorable environment for learning.

4. Name two places within the workplace in which training might be done.

5. Identify four basic considerations in creating a classroom environment which will enhance learning.

6. Identify four considerations in creating a good learning environment at the work site.

7. Identify the best shape for a classroom.

8. Name nine sources of distraction in a classroom and tell how to eliminate the distractions.

9. Name four sources of fatigue in a classroom and tell how to eliminate the fatigue.

10. Name six characteristics of a chair suitable for use in a training room.

11. Describe tables suitable for use in a training room.

12. Name five characteristics of each of the following colors: red, blue, yellow, green.

13. List the six most visible color combinations in order of visibility.

14. Contrast warm, bright colors with cool and dark colors.

15. Give an example of how painting walls in a particular way alters the perception of space.

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Abstract:

The module discusses developments in research in learning environments and why instructional technologists ought to take the lead in applying what is known to designing training areas. Favorable learning environments are described in general terms, and specific characteristics of well designed training facilities are described in detail. Elements included in the descriptions are classroom size and shape, window and wall structure, and furniture design. The use of color and psychological effects of color are also treated in detail.

Description of test:

The test consists of fifteen items which match the objectives and practice exercises.

Text and practice exercises:

Skillful instructors have always paid attention to the environment in which instruction was to take place, and have used what they noticed about favorable environments in an unsystematic way to make learning as easy as possible. In recent years research has confirmed observations and educators have begun to recognize what is known about learning environments and to apply that knowledge systematically to create environments more favorable to learning. Instructional technologists, who are skilled in systematic design and development of instruction, should take the lead in applying what is known about learning environments (Designing facilities..., 1981).

Physical and psychological factors in the environment must both be conducive to relaxation for people to think and learn as effectively as possible (Stokes, 1966). A successful training session comes about when the program meets the needs of the learners, the trainers and speakers are effective, the program is administered efficiently and the total environment is conducive to learning. The environment has a powerful effect on the other variables. The total meeting environment must encourage learners to forget job problems and become thinkers, listeners, and students for the duration of the training session. The environment must make it easy for the group to be together, without outside interference, so that members of the group can focus on the meeting, with a minimum of distractions and inconvenience (Finkel, 1980). A favorable environment for learning comes about as a result of planning (Stokes, 1966).

There are eight separate areas with which instructional designers must be concerned in planning an environment for learning. The areas include the principal meeting room and areas in which group projects are done, which are the focus of this module, as well as areas for breaks, socializing, and recreation, dining and sleeping rooms, and the facility as a whole (Finkel,1980)

If training is to be done in the workplace, it may be conducted at the work site or in a classroom. The location chosen depends on the number of learners and the type of instruction needed. Some training has to be done where the work is done, usually because actual equipment is needed. The learning environment in the workplace is frequently not ideal. It is difficult to overcome all the problems of noise, heat, dirt, danger, complexity, dull routine and distractions simultaneously. If the trainer is a good communicator and shows a genuine effort has been made to provide a good environment for learning, the learners will perceive the environment as a relatively favorable one.

There are several general considerations in creating a favorable learning environment in a classroom or meeting room, whether it is in the workplace or in a training facility. The learners must be comfortable, be able to see and hear, and not be distracted.

Other considerations apply if the work site is the location for the training. Creating a favorable learning environment at the work site is the most difficult challenge faced by the training designer. If possible, learners should be situated so that the trainer or supervisor can help them easily and supervise them easily - and without being obvious. Trainees should be located near one or two experienced workers who can assist their inexperienced co-workers. Tools and equipment must be in good working condition. If a demonstration is required before learners practice in the work area, it may be necessary to conduct the demonstration away from the work site, in a quiet place.

In every area the training designer has to think about decor, furnishings, equipment, layout, and the area's relationship to other areas. Questions which might be asked about each detail of facility design include:

- How can this feature reduce fatigue levels?
- How can it increase interaction?
- Will it contribute to the best environment for individual study?
- Will it help eliminate distractions?
- Will it make the trainer's work easier?

Much is now known about the best way to build classrooms, designs for furniture, and ways to use color. Some of the most useful things we know are contained in the sections of this module which follow.

Before you go on to the next section, take a few minutes to review what you have read. Compare your answers to these questions with the answers suggested on the following page.

Practice Exercises:

1. Give a reason why instructional technologists might be expected to be concerned with learning environments.

2. Describe a favorable learning environment in terms of the factors which must be conducive to learning and the feelings of the learners.

3. Identify five areas in a training facility with which the instructional designer must be concerned in creating a favorable environment for learning.

4. Name two places within the workplace in which training might be done.

5. Identify four basic considerations in creating a classroom environment which will enhance learning.

6. Identify four considerations in creating a good learning environment at the work site.

Answers:

1. Give a reason why instructional technologists might be expected to be concerned with learning environments.

instructional technologists are skilled in (or interested in, etc.) applying what is known about learning in a systematic way to improving instruction

2. Describe a favorable learning environment in terms of the factors which must be conducive to learning and the feelings of the learners.

- physical and psychological factors must be conducive to learning
- learners must be relaxed, able to concentrate on learning and forget job related problems, learners must be students, thinkers, learners must be able to be together as a group without outside interference, so members of the group can focus on the meeting ----- any one of these answers or a combination are correct - any similar answer is correct

3. Identify five areas in a training facility with which the instructional designer must be concerned in creating a favorable environment for learning.

meeting rooms, rooms in which group activities take place, areas for breaks, socializing, and recreation, dining and sleeping rooms, the facilty as a whole ----- any five

4. Name two places within the workplace where training might be done.

classroom or work site

5. Identify four basic considerations in creating a classroom environment which will enhance learning.

learners must be comfortable, be able to see and hear, and not be distracted

6. Identify four considerations in creating a good learning environment at the work site.

learners situated so trainer can help, supervise them - without being obvious
learners must be situated near experienced workers
tools and equipment must be in good working order
demonstrations may have to be conducted away from work site, in quiet place

CLASSROOM ENVIRONMENT

The environment of the classroom or meeting room must be as conducive to learning as the instructional designer can make it. There must be no distractions and no interruptions. Noise should be at a minimum.

Shape

Classrooms should be square. If they are rectangular, the length should be no more than 30% greater than the width. In a square room people come together physically and emotionally. A square room is acoustically effective and makes it easy for people to hear and see, because furniture can be arranged in many ways to enhance sight and hearing (Liebbe, 1980).

Size

Classrooms must be large enough to accomodate the people who must attend the training sessions, as well as necessary equipment and furniture (Stokes, 1966). Overcrowding is a distraction.

Windows

Classrooms should not have windows, since they reduce wall space and are a source of distractions (Liebbe, 1980). If there are windows, they must be covered with shades or blinds so the room can be darkened for projection.

Doors

Classroom doors must be behind the learners to minimize distractions (Liebbe, 1980).

Ceilings

Ceilings must be at least ten feet high. Low ceilings cause a feeling of compression, resulting in fatigue and distraction. A ten foot high ceiling allows projection over the heads of the attendees (Liebbe, 1980, Finkel, 1980).

Wall Accessories

Clocks should be visible only to the instructor. Pictures, charts, and objects not relevant to the instruction should be out of view (Liebbe, 1980, Stokes, 1966).

Chairs

The chair in which the learner sits is the most important piece of furniture in the room. There are six characteristics a chair should have in order to be suitable for use in a training room: wheels, swivel seats, fabric seat covering, adjustable height, tension in the back, and arms. These factors increase comfort and decrease fatigue (Liebbe, 1980).

Tables

Folding tables conserve space. Table tops should be of a light colored leather textured laminate, which is a good writing surface and reduces glare (Liebbe, 1980).

Ventilation

If the room is too warm, people will become drowsy. If the room is too cold, the learners will become nervous and distracted (Stokes, 1966). The ventilation and heating should keep the temperature even and comfortable.

Lighting

The light should be the same at all hours of the day and night and in all kinds of weather. Awareness of the passage of time and of weather conditions are distracting (Finkel, 1980). Glare is fatiguing and therefore it must be controlled. The light must be even, with no shadows on the walls, and it should be warm, to create a favorable mood for learning and minimize fatigue (Finkel, 1980).

Practice Exercises:

1. What is the best shape for a classroom?

2. Name nine sources of distraction and tell how to eliminate the distractions.

3. Name four sources of fatigue and tell how to eliminate the fatigue.

4. Name six characteristics of a chair suitable for use in a training room.

5. Describe tables suitable for use in a training room.

Answers:

1. What is the best shape for a classroom?

square

2. Name nine sources of distraction and tell how to eliminate the distractions.

1. overcrowding - use a sufficiently large classroom
2. windows - eliminate them
3. doors in front of the learners - doors must be at the rear
4. low ceilings - ceilings must be ten feet high at minimum
5. clocks - must be visible only to instructor
6. charts, pictures, objects not relevant to the instruction - must be out of sigh
7. cold room - must be kept warm enough
8. awareness of time of day, passage of time - uniform artifical light
9. awareness of changes in weather, weather conditions - uniform artificial light, no windows

3. Name four sources of fatigue and tell how to eliminate the fatigue.

low ceilings - ceilings must be at least ten feet high
room too warm - keep temperature sufficiently low, have adequate ventilation
glare - eliminate it
improperly designed chair - use best available chair

4. Name six characteristics of a chair suitable for use in a training room.

wheels, swivel seat, fabric seat covering, adjustable height,
tension on back, arms

5. Describe tables suitable for use in a training room.

folding
light leather textured laminate tops

COLOR

Color is another element in the classroom or meeting room environment, but is is so powerful, and so much is known about it, that it warrants a separate section in this module.

Color can have a strong, positive effect on a range of human behavior and emotions, but for any positive effect to occur, application of color must be aesthetically pleasing. People are sensitive to color itself as well as to form, proportion, and harmony in color combinations. If color is too bright and dramatic, people become uncomfortable (Birren, 1961). People's color preferences change with age and color symbolism and preferences are very different among cultures (Sinofsky, 1981).

There is considerable medical and anthropological evidence about the effect of color, which can be applied systematically to the design of instruction (Birren, 1961).

Red

Red is the most dominant and dynamic color. It is exciting and stimulating. It is cheerful for the melancholy or lazy, but increases restlessness and nervous tension, and is upsetting to the overactive and nervous.

Red provides a good environment for the creation of ideas, but not for carrying out ideas. Under the influence of red, weights seem heavier and time seems to pass more slowly than it actually does. Red is a good color to use in places where the apparent slow passage of time is desirable, such as in restaurants.

Pure red is so vivid it can seldom be used in interiors. Rose, maroon, and pink are popular variations of red which are often used in interiors.

Orange has the same qualities as red, and is usually not used in its pure form in interiors either. Its tints, peach and salmon, and shades such as brown are used. Peach is ideal in interiors. It is cheerful and very flattering to the human complexion

Blue

Blue is restful and sedate. Blue soothes nervous people, but depresses the morose. It has the opposite effect from red on preception of passage of time. Under the influence of blue time seems shorter than it really is, and weights seem lighter. Blue is therefore a good color for heavy burdens, and for areas in which monotonous or unappealing tasks must be done.

Yellow

Yellow has the highest visibility of all colors. It is usually thought of as cheerful, although some shades are associated with cowardice. Yellow is generally an appealing color, and is useful in overcoming dim illumination.

Green and Blue Green

Green reduces nervous and muscular tension. It is ideal for concentration and meditation. While red is good for producing ideas, green is needed for bringing those ideas to fruition. This suggests that in most learning facilities, two separate and different kinds of environment will be needed.

Blue green is good with peach, and has similar effects. Blue green is also flattering to the human complexion.

White, Gray, Black, Purple

Purple is not good for large areas because it disturbs the focus of the eye. White is natural and clear; black tends to be negative, and gray is passive. All three are relatively neutral emotionally, and have little psychological effect (Birren, 1961. Sinofsky, 1981).

Combinations for Visibility

The most visible color combinations, in order, are:

yellow with black
green on white
red on white
blue on white
white on blue
black on white

Other highly visible combinations, good for use in signs and displays, are:

white on blue
black on orange
orange on black
white on red
red on yellow
orange on white
red on green (Sinofsky, 1981).

Effect of Color

Warm colors are exciting and bright colors are stimulating. Physical activity is better performed in bright light amid bright surroundings.

Cool colors are tranquilizing, and darkness is relaxing. Exacting mental and visual tasks are better performed in softer, deeper colors with ample illumination. (Birren, 1961).

In one study children tested in rooms seen as beautiful, painted in shades of light blue, yello, yellow green, and orange, scored twelve points higher than the norm on IQ tests. Children tested in rooms thought of as ugly, painted in white, black, and brown, scored fourteen points lower than the norm. It appears we should paint testing areas in cool, soothing colors. (Sinofsky, 1981).

Crowded rooms painted in light tones have a greater feeling of spaciousness than they otherwise would have (Sinofsky, 1981).

Painting opposite walls of a narrow room darker and lighter shades of the same color makes the room seem wider. Long corridors can be made to seem shorter by painting doors and areas near doors a bright, dark tone, with a lighter contrasting tone in the areas between the doors. Another way to make a corridor seem shorter is to paint the end walls a brighter, lighter accent color.

Practice Exercises:

1. Name five characteristics of each of the following colors: red, blue, green, yellow.

2. List the six most visible color combinations in order of visibility.

3. Contrast warm and bright with cool and dark colors.

4. Give an example of how painting walls in a particular way alters the perception of space.

Answers:

1. Name five characteristics of each of the following colors: red, blue, green, yellow.

red -
most dominant and dynamic
exciting and stimulating
cheerful for melancholy, lazy
increases restlessness and nervous tension
upsetting for the overactive and nervous
good environment for creation - not execution - of ideas
weights seem heavier
time seems to pass more slowly
good in places where we want time to pass slowly
too vivid for interiors
rose, maroon, pink popular, commonly used in interiors
orange has same qualities
tints of orange - peach and salmon - good in interiors
peach is flattering ----- any five

blue -
restful and sedate
soothes the nervous
depresses the morose
opposite effect from red on feeling of weights, passage of time
good for heavy burdens, areas in which monotonous, unpleasant tasks must be done
----- any five

green

reduces nervous, muscular tension
ideal for concentration, meditation
needed for bringing ideas to fruition
blue green good with peach, similar effect, flattering
----- any five

yellow

highest visibility
cheerful, although some shades associated with cowardice
appealing
useful in overcoming dim illumination

2. List the six most visible color combinations in order of visibility.

yellow with black
green on white
red on white
blue on white
white on blue
black on white

Answers, cont.

3. Contrast warm, bright colors with cool and dark colors.

warm - exciting
bright - stimulating
cool - tranquilizing
dark - relaxing
warm, bright - good for physical activity
cool, darker with good illumination - good for mental and visual tasks

4. Give an example of how painting walls in a particular way alters the perception of space.

crowded rooms in light colors seem less crowded

painting opposite walls of a narrow room darker and lighter shades of the same color - room seems wider

shorten long corridor by painting doors and surrounding areas bright, dark tone and intervening wall areas with lighter contrasting tone

shorten long corridor by painting end walls in a brighter, lighter accent color

----- any one of these examples

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LEARNING ENVIRONMENTS: TEST

1 1. Give a reason why instructional technologists might be expected to be concerned with learning environments.

3 2. Describe a favorable learning experience in terms of the factors which must be conducive to learning and the feelings of the learners.

5 3. Identify five areas in a training facility with which the instructional designer must be concerned in creating a favorable environment for learning.

2 4. Name two places within the workplace in which training might be done.

4 5. Identify four basic considerations in creating a classroom environment which will enhance learning.

4 6. Identify four considerations in creating a good learning environment at the work site.

1 7. Identify the best shape for a classroom.

9 8. Name nine sources of distraction in a classroom and tell how to eliminate the distractions.

4 9. Name four sources of fatigue in a classroom and tell how to eliminate the fatigue.

6 10. Name six characteristics of a chair suitable for use in a training room.

2 11. Describe tables suitable for use in a training room.

5 12. Name five characteristics of each of the following colors: red, blue, yellow, green.

6 13. List the six most visible color combinations in order of visibility.

2 14. Contrast warm, bright colors with cool and dark colors.

1 15. Give an example of how painting walls in a particular way alters the perception of space.

55 - 52 A
51 - 48 B
Below 48 Study and retake test